

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An isolated nucleic acid comprising a polynucleotide sequence, or complement thereof, encoding a polypeptide comprising

~~an amino acid sequence at least 40% identical to DMT Domain A (SEQ ID NO:71), or~~
~~an amino acid sequence at least 40% identical to DMT Domain B (SEQ ID NO:72), or~~
~~an amino acid sequence at least 40% identical to DMT Domain C (SEQ ID NO:73), or~~

a combination thereof wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

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- (a) glycosylase activity;
 - (b) demethylation of polynucleotides;
 - (c) DNA repair;
 - (d) modulation of organ identity;
 - (e) modulation of organ number;
 - (f) modulation of meristem size and/or activity;
 - (g) modulation of flowering time;
 - (h) modulation of methylation of chromosomal DNA in the cell;
 - (i) modulation of endosperm development;
 - (j) modulation of expression of the MEDEA gene.

2. (Original) The isolated nucleic acid of claim 1, wherein the polypeptide is at least 70% identical to SEQ ID NO:2.

3. (Original) The isolated nucleic acid of claim 1, wherein the polypeptide is SEQ ID NO:2.

4 and 5. (Canceled)

6. (Original) The nucleic acid of claim 5, wherein the polypeptide comprises either a

- (i) basic region;
- (ii) nuclear localization signal;
- (iii) leucine zipper;
- (iv) helix-hairpin-helix structure;
- (v) glycine-proline rich loop with a terminal aspartic acid or
- (vi) helix that is capable of binding DNA.

7. (Currently amended) The isolated nucleic acid of claim 1, wherein the nucleic acid further comprises a promoter operably linked to the polynucleotide sequence.

8. (Original) The isolated nucleic acid of claim 7, wherein the promoter is a constitutive promoter.

9-12. (Withdrawn)

13. (Currently amended) An expression cassette comprising a promoter operably linked to a ~~heterologous~~ polynucleotide sequence, or a complement thereof, encoding ~~the a~~ polypeptide of ~~claim 1~~ comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the promoter is heterologous to the polynucleotide sequence, and wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) glycosylase activity;
- (b) demethylation of polynucleotides;
- (c) DNA repair;
- (d) modulation of organ identity;
- (e) modulation of organ number;
- (f) modulation of meristem size and/or activity;
- (g) modulation of flowering time;
- (h) modulation of methylation of chromosomal DNA in the cell;
- (i) modulation of endosperm development;

(j) modulation of expression of the MEDEA gene.

14. (Withdrawn)

15. (Currently amended) A host cell comprising an exogenous ~~polynucleotide sequence~~ nucleic acid comprising a polynucleotide sequence, or complement thereof, encoding the polypeptide of ~~claim 1~~ comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

(a) glycosylase activity;

(b) demethylation of polynucleotides;

(c) DNA repair;

(d) modulation of organ identity;

(e) modulation of organ number;

(f) modulation of meristem size and/or activity;

(g) modulation of flowering time;

(h) modulation of methylation of chromosomal DNA in the cell;

(i) modulation of endosperm development;

(j) modulation of expression of the MEDEA gene.

16. (Original) The host cell of claim 15, wherein the nucleic acid further comprises a promoter operably linked to the polynucleotide sequence.

17. (Original) The host cell of claim 16, wherein the host cell is a plant cell.

18. (Currently amended) A method of modulating transcription, the method comprising,

(a) introducing into a host cell ~~an~~ the expression cassette of claim 13; and

(b) selecting a the host cell with modulated transcription, wherein the modulated transcription is determined by comparing the level of transcription in the host cell with the level of transcription in a cell that does not comprise the expression cassette of claim 13.

19. (Original) The method of claim 18, wherein the expression cassette is introduced by *Agrobacterium*.

20. (Original) The method of claim 18, wherein the expression cassette is introduced by a sexual cross.

21. (Original) The method of claim 18, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

(a) wherein enhanced expression of the polypeptide in a plant results in a delay in flowering time;

(b) wherein introduction of the polypeptide into a cell results in modulation of methylation of chromosomal DNA in the cell;

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(c) wherein reduction of expression of the polypeptide in a plant results in enhanced endosperm development;

(d) wherein expression of the polypeptide in an *Arabidopsis* leaf results in expression of the MEDEA gene.

22-23. (Withdrawn)

24. (Currently amended) A transgenic plant cell or transgenic plant comprising a polynucleotide sequence, or complement thereof, encoding a polypeptide ~~of claim 1~~ comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

(a) glycosylase activity;

(b) demethylation of polynucleotides;

(c) DNA repair;

(d) modulation of organ identity;

(e) modulation of organ number;

(f) modulation of meristem size and/or activity;

(g) modulation of flowering time;

- (h) modulation of methylation of chromosomal DNA in the cell;
- (i) modulation of endosperm development;
- (j) modulation of expression of the MEDEA gene.

25. (Currently amended) A plant which has been regenerated from a the plant cell according to 24.

26. (Original) The plant of claim 25, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) wherein enhanced expression of the polypeptide in a plant results in a delay in flowering time;
- (b) wherein introduction of the polypeptide into a cell results in modulation of methylation of chromosomal DNA in the cell;
- (c) wherein reduction of expression of the polypeptide in a plant results in enhanced endosperm development;
- (d) wherein expression of the polypeptide in an Arabidopsis leaf results in expression of the MEDEA gene.

27-29. (Withdrawn)

30. (New) The isolated nucleic acid of claim 1, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

31. (New) The expression cassette of claim 13, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

32. (New) The host cell of claim 15, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

33. (New) The transgenic plant cell or transgenic plant of claim 24, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.